

Letter to the editor: “Targeting cerebrovascular myogenic dysfunction in stroke”

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TO THE EDITOR: We read with great interest the recently published study by Coucha and colleagues (3) in *American Journal of Physiology-Heart and Circulatory Physiology* on the association between protein nitration and myogenic tone impairment in middle cerebral arteries (MCAs). This study provides a mechanistic explanation for the previous observation that myogenic tone impairment extends beyond the territory of the occluded MCA (1, 5, 8) and indicates that peroxynitrite-induced nitration is an important factor involved in myogenic dysfunction after stroke (6). Advances in understanding communication between the brain and periphery are relevant to stroke research. The authors discuss the possibility that ischemia-reperfusion (I/R) injury may extend to vascular territories outside the brain. Consistently, we have previously described endothelial dysfunction in rat mesenteric resistance arteries after transient MCA occlusion, a process likely linked to excessive oxidative stress (7) (Fig. 1). Interestingly, the authors unveil a previously unidentified physiological role of low levels of peroxynitrite in MCA myogenic tone development, acting through different mechanisms in both the ischemic and the contralateral hemispheres (3). Certainly, further studies are warranted to assess the nature of this coordinated and spatially different action of peroxynitrite to maintain the homeostasis of the brain's microenvironment.

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A time threshold of MCA occlusion has been described for myogenic responses in rat MCAs (1, 2). Previous studies suggest that once established, MCA myogenic impairment extends into late stages (8). An important question that needs to be addressed is whether it is possible and clinically relevant to prevent/reverse myogenic impairment within a reasonable therapeutic time window. In a previous study, ischemic rats developed smaller infarcts after treatment with an antioxidant administered orally at 30 min after the onset of reperfusion, though the I/R-induced myogenic impairment remained unaltered (4). In the study by Coucha et al. (3), several drugs are intraperitoneally administered to elegantly describe the mechanisms involved on the aforementioned myogenic impairment induced by I/R. We would greatly appreciate receiving a comment from the authors on the therapeutic window of opportunity for the treatments used in their investigation to prevent/reverse myogenic impairment. It would also be interesting to know the impact of these treatments on stroke outcome (i.e., infarct volume and neurological deficits), since it would provide valuable insights into the potential clinical benefits of targeting MCA myogenic function after stroke.

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DISCLOSURES

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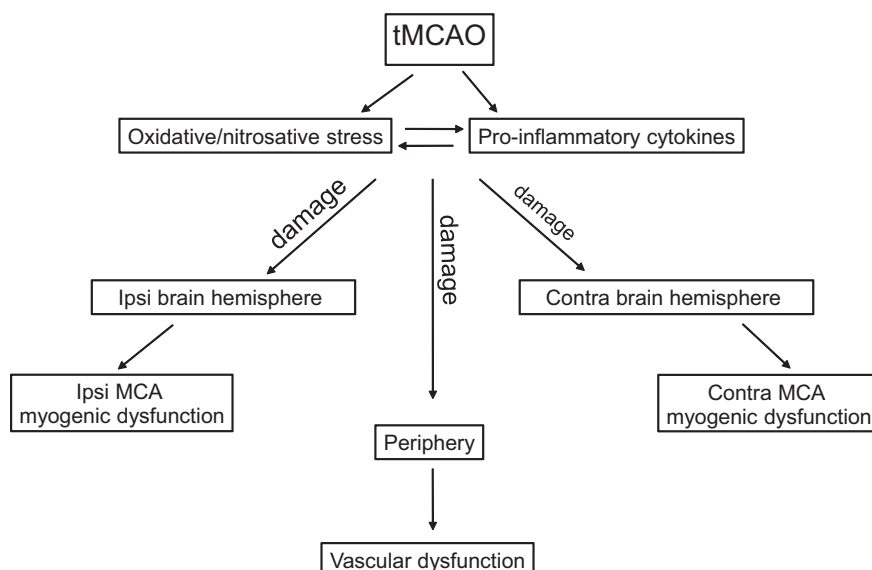


Fig. 1. Propagation of vascular dysfunction during ischemia-reperfusion involves both brain hemispheres and the periphery. MCA, middle cerebral artery; tMCAO, transient middle cerebral artery occlusion; Ipsi, ipsilateral; Contra, contralateral.

AUTHOR CONTRIBUTIONS

F.J.-A. and E.V. prepared figures; F.J.-A. drafted manuscript; F.J.-A., A.M.P., and E.V. edited and revised manuscript; F.J.-A., A.M.P., and E.V. approved final version of manuscript.

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